

Historic, Archive Document

Do not assume content reflects current scientific knowledge, policies, or practices.

REPORTS ON FOREIGN MARKETS FOR AGRICULTURAL PRODUCTS

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF MARKETS
FOREIGN MARKETING INVESTIGATIONS

Washington, D. C., January 22, 1920.

THE LIVESTOCK INDUSTRY OF URUGUAY AND PARAGUAY

By David Harrell, Livestock Commissioner in South America, and H. P. Morgan, Assistant in Marketing Livestock and Meats, Bureau of Markets.

I. - LIVESTOCK IN URUGUAY

Uruguay is the smallest republic in South America, having an area of about 72,210 square miles, slightly larger than the state of Missouri. The estimated population in 1915 was 1,400,000. The climate is temperate, with comparatively slight variation, the average temperature being about 62.5°F. The mean midsummer temperature is 72.2°; in winter the average is about 55°. Although some tropical vegetation is found in the northern provinces, by far the greater part presents the flora of a typical temperate climate.

Montevideo, the capital and chief port, is easily accessible, as it is situated on the estuary of the Rio de la Plata. The port has docking facilities for ocean vessels.

Uruguay a Stock-Raising Country

Uruguay is principally a stock-raising country, and about 93 per cent of the exports are meats and other animal products, as shown by Table 1.

TABLE 1. - Value of the Exports of Uruguay for the
Year 1917 in Uruguayan gold

Commodities	Value	Percentage of total
Livestock and meats	\$90,383,534	97.7
Other agricultural products	179,370	.2
Mineral products	341,578	.4
Fish and game	134,310	.1
Ships' provisions	142,399	.2
All others	1,334,583	1.4
Total	\$92,516,274	100.0

For this reason the prospect for the improvement of livestock in Uruguay is of the utmost importance. This has been anticipated by the various stockmen of English, American, and other nationalities residing there to such an extent that very little of the livestock seen in this country is purely native. The latest census of the livestock in Uruguay was taken in 1916. The total numbers are given in Table 2.

TABLE 2.-- Census of Livestock of Uruguay in 1916

Cattle	7,802,442	::	Goats	12,218
Sheep	11,472,871	::	Mules	14,410
Horses	554,871	::	Donkeys	3,127
Hogs	303,958	::		

Land in Uruguay is rather expensive, unless one considers the possible returns and unless a comparison is made between the advantages to be had in this country over some other sections of South America. In general, a good campo* is expected to carry two cows and six sheep per hectare (2.471 acres) per year. This allows for unfavorable seasons, as in a particularly favorable year this capacity could be increased approximately one-third. In topography the land is slightly rolling generally, with many broad plains and an abundance of good water. Although there are many large campos, the tendency in Uruguay is to divide the land into smaller campos than in any other country. As a natural result it is possible to give greater care and attention to the raising of livestock and a more rapid progress is thus accomplished.

The natural grasses are generally of a fine mixture containing some bur clover. The poorer campos contain some common bunch-grass, but with the eradication of this, a very great improvement is noted. Much of the land of Uruguay is available for agricultural purposes and practically every ranch maintains some agricultural pursuit. Corn and oats are the most common grains, and in some places special feeding is being attempted in the effort to put cattle on the market in better condition. The general rule, however, is to market the steers directly from the pastures.

Although alfalfa has been tried repeatedly, it seems that the sub-soil is not proper for its growth. This is offset, however, by the quality of the natural grasses and such other planted grasses as have been introduced.

Prospects for Pure-bred Livestock

By its geographical location Uruguay is very favorably situated for the production of pure-bred livestock. With an outlet for any surplus in various parts of Brazil, particularly for animals raised in the tick-infested districts, this industry assumes a very important place. It will also be seen that it is possible to import livestock readily from Argentina, and this is practiced to a very large extent.

*The Spanish word "campo" is equivalent to the English word "range" or ranch land.

CATTLE

Livestock Expositions.---As a further means of stimulating interest and general education, a national cattle exposition, with sections for other livestock, is held annually at Montevideo under the auspices of the "Asociacion Rural del Uruguay." The fourteenth one was held this year from August 23 to 27.

Another livestock exposition is held at Salto, in the Department of Salto, and this is rated among South American shows as second only to the annual Palermo Livestock Exposition of Argentina. Situated across the Rio del Uruguay from Argentina, the Salto exhibition has become international, so that there is competition between animals from both Argentina and Uruguay. As Salto is also located in the heart of one of the largest cattle-raising sections, an opportunity is afforded stockmen to secure improved stock. The practice is to send large numbers of bulls and surplus campo breeding stock* to the exposition. These may or may not compete with animals especially fed for the show. After the awards have been made, it is customary to hold auction sales in which large numbers of animals change hands. Sheep and hogs are also shown at these expositions.

Other expositions are held during this season in other Departments of Uruguay, and throughout all there is a keen interest and competition between breeders. One noteworthy fact regarding the animals at the expositions this year was that very few cattle were highly fitted, thus escaping the injury which sometimes results from the practice in the United States and other countries of highly fitting animals for the show ring.

Importation of Pure-bred Stock.---Although the proximity to Argentina makes that country a natural source of supply for imported stock for Uruguay, the practice of securing animals from the United States, England, and other countries is becoming more and more prevalent. Both the Hereford and the Shorthorn are held in very high favor, with possibly a preference for the former. Inasmuch as Shorthorns are more numerous in Argentina, this breed especially is sought in other countries for importation into Uruguay. The fact that Uruguayan buyers appreciate the value of improved livestock and the necessity for securing good animals sets the prices received for such imported stock generally high enough to allow a profit to the seller. At the present time several methods for the handling of this stock are being developed. There is an increasing tendency on the part of some of the stockmen to visit the exporting country and to make purchases personally; another practice is to have the stock sent on consignment or order to an agent in Uruguay.

A market is being developed in Brazil for Uruguayan-bred livestock. Animals which have been raised on campos infested with the tick and which have been developed especially for campo breeding purposes are finding an outlet in various parts of Brazil. Both bulls and cows are exported, and a very interesting practice is growing; i.e., the selling of cows with calves. Such stock is sold for approximately \$250 U. S. currency. It will be seen, therefore, that there is a rotation of imports and exports of pure-bred cattle which is especially favorable to Uruguay, as it is possible to continue the improvement of local herds and at the same time assist in the improvement of livestock for Brazil.

*"Campo breeding stock" refers to the breeding of high-grade animals.

Prevalence of the Cattle Tick.---The Rio Negro forms the dividing line between the area which is infested with the tick and the tick-free territory. Although an active effort is being made to secure the complete eradication of the tick in Uruguay, concerted effort such as has been made in the United States has not been possible. It should not be assumed, however, that there are no improved cattle in the tick-infested region.

Tick Eradication.---One very interesting means employed by a few stockmen in this district is the cleaning of several carloads of cows and shipping them to Montevideo, where a highly bred bull is kept. After service these cows are reshipped to the ranch and thus gradually a more or less tick-immune herd is developed. This method, however, is very expensive, and with the establishment of more dipping vats, particularly if concerted action is taken, this district will doubtless be free from the tick in the future.

Prevalence of Foot-and-Mouth Disease.---Another interesting feature of the raising of stock in Uruguay is the prevalence of "aftosa", or foot-and-mouth disease. It is seldom that the country is entirely free from this disease, which, as in all other places, takes the form of an epidemic. It is rather surprising that very little is thought of the seriousness of this disease. At both the Montevideo and Salto expositions an outbreak occurred, and even the prize winners were taken sick. It is seldom, however, that any large percentage of the animals die, which may indicate that it is either another form of the disease as known in the United States or that it is much less virulent. The usual treatment is to feed some green feed such as alfalfa. It is encouraging to know that of some 40 head of imported stock that arrived during the month of September all immediately contracted the foot-and-mouth disease, yet none were lost, showing that no great apprehension need be felt as regards stock not acclimated to Uruguay.

At present there is no means at hand for the control of this disease. The quarantine methods employed in England and the United States would be disastrous in Uruguay, as at times from 50,000 to 100,000 cattle in any one district may be suffering at the same time. The principal effect is the loss in flesh, particularly of market stock, and the consequent longer time necessary to get stock in condition for market. It was estimated that the foot-and-mouth disease adds from seven months to a year to the time between the birth and the marketable age of a steer.

SHEEP

With 11,472,371 sheep, this branch of the livestock industry assumes an importance second only to cattle. The fact that practically every ranch makes a practice of handling sheep and cattle together makes it possible to spread this activity throughout the country. Table 3 shows the relative extent of the different breeds in 1917.

Table 3. - Number of Pure-Bred Sheep Registered in the
"Asociacion Rural del Uruguay" in 1917

Breed	Rams	Ewes	Lambs	Total
Devon L. W.	4	25	6	35
Hampshire	17	--	--	--
Lincoln	238	358	173	769
Merino	223	1,319	569	2,111
Romney-Marsh	190	331	132	653
Grand total	672	2,033	880	3,585

In the sheep sections of both the Montevideo and the Salto expositions this year (1919) large numbers of excellent specimens were exhibited, and at the Salto exposition particularly, there was a very large sale of breeding stock. The general practice is to send from 50 to 300 ewes and rams to the show. The best of these are shown in pen lots of ten. After the awards have been made, the value of the stock belonging to the winner is greatly enhanced and it brings relatively high prices. An opportunity is thus afforded for the visitors to secure improved breeding stock from camps which specialize in the raising of sheep.

The sheep-raising industry in Uruguay appears to be especially well founded, and very little stimulation is necessary to convince breeders of the importance of improving their stock. Pure-bred rams and ewes are imported regularly from England; one lot of five rams exhibited at the Salto show being sold for 500 pesos apiece (approximately \$525 U. S. currency).

With more and more attention being directed toward wool, many of the ranches are crossing Rambouillet and Merino sheep on the larger-framed native Romney-Marsh and Lincoln. It seems logical to assume that in the future it will be found practicable in Uruguay to use much the same system as has been employed for many years in the western wool-producing section of the United States; viz, that of producing the cross-bred wool-and-mutton type of sheep.

SWINE

Although the swine industry occupies fourth place among the livestock industries of Uruguay, with a total of but 303,953 head, it is growing steadily. As more and more attention is being paid to agriculture, the interest in hogs likewise is increasing. The fact that there is no artificial growth in either of these two closely allied branches makes the place of the hog especially secure as applied to the development of the general livestock industry in Uruguay. At present the Berkshire, Tamworth, Poland-China, and Duroc-Jersey are the most popular breeds, with very few pure-bred herds in the country. The exhibits at the two livestock expositions contained very few good representatives of these breeds. In view of this need, it would seem that a good opportunity is presented for the introduction of good types of swine in Uruguay. With the general ranch owners' interest in improved livestock it should be comparatively easy to extend this to include hogs as soon as it becomes apparent to them that hog raising is profitable.

HORSES

At the present time by far the larger number of horses raised in Uruguay are of the light types, ranging from saddlers to light carriage horses. Such draft horses as are seen in the streets at Montevideo and the other larger places have been imported usually from Argentina. This situation is logical, owing to the fact that improved roads are uncommon and until recently the greater part of the draft work in the outlying districts has been done by means of oxen. It is a very common sight to see four and five mules hitched to a two-wheel cart, showing the undeveloped methods of transportation. It will readily be seen that horses as developed in the United States are virtually unknown in Uruguay.

In general the Uruguayan is very proud of his horses, however, and it should not be assumed that this phase of the industry will not develop as soon as better roads are available. Some very fine specimens of the lighter type of horses were noted; the general class of saddle horses used on the ranches contained Anglo-Arabian blood.

Growth of the Meat Industry

At the present time, there is an excellent outlet for all surplus stock in Uruguay, as the canning plants and chilling or freezing plants located there are easily able to take care of the supply. Originally, as in Brazil, the principal outlet for livestock was the plants for salt-meat, but with the establishment of the canning and meat-extract plants, competition for supplies became very keen, and with the enhanced value of the stock owing to the more profitable use made of it, salt-meat plants have been steadily decreasing in number of animals killed per year, as shown by Table 4.

TABLE 4. - Animals Slaughtered in the Canning, Meat-Extract, and Salt-Meat Plants of Uruguay by 5-year periods

Period	Canning and Extract plants	Salt-Meat plants
1898-1902	627,600	2,345,000
1903-1907	827,300	2,769,600
1908-1912	646,600	2,471,364
1913-1917	335,900	554,886

Table 5 shows the growth of the meat-chilling industry and should form a guide to the improvement of the livestock of Uruguay.

As might be supposed, there is a very great interest shown at all times in the general livestock industry and because of the fact that competition between individuals has become so keen, the interest in pure-bred livestock has likewise become a very important matter.

TABLE 5. - Animals Slaughtered in Various Meat Industries of Uruguay, 1911 - 1917.

Year	Freezing Plants			Salt-meat plants		Meat-canning factories		Total		
	Cattle	Sheep	Swine	Cattle	Sheep	Cattle	Sheep	Cattle	Sheep	Swine
1911	23,231	283,465	--	437,259	1,171	114,791	7,255	575,281	296,891	--
1912	68,481	333,544	--	379,729	--	103,968	--	552,178	333,544	--
1913	132,650	311,111	--	185,635	--	81,367	--	399,652	311,111	--
1914	278,388	110,869	--	97,542	--	59,134	--	435,064	110,869	--
1915	463,196	157,950	--	48,280	--	63,661	--	575,137	157,950	--
1916	369,666	192,955	--	63,110	--	110,033	--	542,809	192,955	--
1917	509,301	87,914	12,854	105,608	--	160,370	--	775,278	87,914	12,854

Summary

Uruguay is a country which, although greatly limited in area, is almost wholly devoted to the raising of livestock. The development of agriculture which may be expected to increase each year should produce the same

result as has been experienced already in the United States; viz, smaller but better herds of livestock. At the same time there are sections of this country where livestock production will always remain the primary occupation and the great interest which has been created is sure to grow and is possible of direction. With markets already at hand for all surplus livestock both for breeding and meat purposes Uruguay is especially fortunate; this, with a source of supply of improved stock in such close proximity as Argentina, is another feature which is of decided advantage to this country.

Recommendations for Developing the Uruguayan Market

As in all other countries of South America, the burden of developing and increasing the market for pure-bred livestock rests with the seller. Regardless of the need for improved stock and no matter how apparent this is to the Uruguayan stockmen, only a limited number of direct personal purchases will be made. It is true that an increasing number of visitors will come to the United States market, but the volume of business transacted by them will amount to very little as compared to that to be expected from a systematically developed market in Uruguay.

With this fact so apparent, it is recommended that direct connections be made with agents in Uruguay for handling consignments and orders. The greatest success should come from consignments, which may result in direct repeat orders. It has been the effort in this report to point out the fact that only good stock will sell at a profit in Uruguay. There is a strong active demand for good stock which will improve the already improved stock. It will be a serious detriment to future aspirations of American stockmen to attempt to foist second-grade stock upon Uruguay. On the other hand, faithfully executed orders and an effort on the part of dealers in the United States to satisfy Uruguayan customers can be expected to result in success.

Although there is active competition to be expected from England and Argentina - and the experience of the former and proximity of the latter give them a great advantage - there is a well-defined sentiment in favor of livestock from the United States. The United States types of Hereford, Shorthorn, and Angus cattle are favorably commented upon by practically all livestock men interviewed, and competition to be expected is in about the following order: Shorthorn, Angus, Hereford. The position taken by the United States with respect to Uruguayan livestock importations will rest upon the ability of our dealers to handle this foreign trade to the satisfaction of the buyers. The market and export business really desired by anyone attempting to enter this field should be studied carefully.

II. - LIVESTOCK IN PARAGUAY

Physical Features.---Several features combine to make Paraguay a rather difficult problem for the breeder of pure-bred livestock in considering this country as a possible market. Although Paraguay is one of the smaller republics of South America and in some ways is undeveloped, it possesses several possibilities for promoting the livestock industry. A survey of a relief map of Paraguay shows that as regards the livestock industry there are two distinct sections: The country west of the central divide extending southward is sparsely settled and is taken up largely by campos or ranches. South of this section is a district of lower wooded country which is unimportant from the standpoint of the livestock raiser.

A vast plain called the "Gran Chaco" lies between the Paraguay and the Pilcomayo rivers, the latter separating it from the Argentine Chaco. This territory extends northward to the Cordillera of Chocis and northwest to the river Parapiti. As there is no feature which might serve as a natural boundary between Bolivia and Paraguay, both of which claim the entire territory, there is an endless dispute in progress. Land titles are unsound, and as a consequence the upper region especially is undeveloped.

In general the Gran Chaco is a level expanse with a very slight slope to the northwest. The almost absolute flatness of this area accounts for the frequent inundations of large parts, although the fact that there are frequent knolls and higher ground makes it possible to save the cattle. The grass is described as a rather good quality, abundant, natural pasturage. Although the heavier rains at times cause flooded areas, the most serious inundations are caused by the rising of the Paraguay; however, this rise is so gradual that it need not be serious to cattle owners in the district. These floods are of rare occurrences. In recent years two serious floods occurred, one in 1904, which destroyed many cattle, and one in June, 1919, in which very few cattle were lost, owing to the vigilance of the owners.

An interesting feature of the watering system for livestock is the saline water holes which relieve the stockman of providing for this prime cattle necessity.

The Gran Chaco is considered to be the most important district for stock-raising. With so vast an area clear of underbrush and possessing a fine natural grass it seems evident that livestock should be of primary importance. Land in this section is valued as to its location with regard to the river rather than its productive importance. With relatively cheap land, good grass, and a market, only a few points as regards the raising of livestock remain to be considered, chief of which is the climate.

It must be borne in mind that countries in the more tropical climates of this continent have very serious pest problems. The Texas-fever tick immediately assumes a very important place in Paraguay, together with the foot-and-mouth disease. Table 1 shows that the average temperature throughout the year is about 74°F., and the difference between the mean summer and winter temperature is about 20°. In the summer months - that is, December, January, and February - the temperature may rise to 106°, but in some years may not exceed 98°. The minimum winter temperature - that is, for the months of June, July, and August - will vary over a number of years between 33° and 42°, but in districts back from the rivers will sometimes fall below freezing. It may be said that about 100 days in the year are ex-

cessively hot, between 30 and 40 uncomfortably cool, and the remainder of the year may be considered pleasant. Table 2 gives the average rainfall for 1915 - 1917.

TABLE 1. - Maximum, Mean, and Minimum Temperature (°F.)
in Paraguay, 1915 - 1917

Month	1915			1916			1917		
	Max.	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.
Jan. --	104.9	82.4	64.0	104.0	80.7	60.8	110.3	86.0	57.2
Feb. --	106.0	84.7	70.0	98.6	80	59.0	104.0	82.2	60.8
Mar. --	99.5	77.3	55.0	102.2	77	55.4	108.0	80.2	56.3
Apr. --	99.0	77.9	59.0	99.5	78.5	53.6	96.0	70.3	46.4
May --	94.6	73.0	46.4	93.2	70.5	51.8	86.0	62.4	39.2
June --	86.3	57.3	34.1	86.0	54.5	35.6	84.2	54.7	39.7
July --	92.6	55.6	33.8	91.4	59.6	34.7	85.1	62.7	41.0
Aug. --	98.2	70.0	44.6	94.4	70.5	41.0	94.6	66.5	35.4
Sept. --	100.0	69.0	42.8	104.0	76.4	37.4	100.9	76.8	44.9
Oct. --	103.0	74.1	53.6	103.0	75.9	50.9	95.0	73.0	50.0
Nov. --	104.3	75.9	56.3	105.8	80.7	53.6	100.7	78.0	47.3
Dec. --	105.8	81.0	54.5	108.5	81	55.4	105.0	84.7	62.4

TABLE 2. - Average Rainfall (in inches) in Paraguay, 1915 - 1917

Month	1915	1916	1917	Month	1915	1916	1917
Jan. --	6.067	11.976	2.311	July --	0.028	3.633	1.429
Feb. --	2.224	6.146	1.259	Aug. --	0.988	.705	.024
Mar. --	9.043	3.154	4.839	Sept. --	2.228	.374	4.953
Apr. --	7.933	3.327	8.748	Oct. --	3.252	1.799	4.472
May --	6.882	10.894	2.019	Nov. --	5.098	1.516	2.874
June --	.346	3.465	1.622	Dec. --	6.339	3.468	6.320

Numbers of Livestock

All data pertaining to numbers of animals in Paraguay are estimates. Up to present it has been impossible to conduct a census that would be correct, and Table 3 is presented by Government authorities as being as accurate as possible.

TABLE 3. - Estimated Numbers of Livestock in Paraguay
for 1877, 1886, 1899, 1902, and 1915

Animal	1877	1886	1899	1902	1915
Cattle	209,525	729,796	2,283,030	2,450,960	5,249,043
Sheep	6,668	32,351	214,058	222,286	600,000
Horses	21,140	62,386	182,790	217,872	478,000
Mules and asses:	2,799	4,164	7,557	14,210	35,000
Hogs	3,026	12,250	23,837	37,491	61,000
Goats	--	11,102	32,334	49,599	27,000

Prospects for Livestock

CATTLE

Conversation with conservative people connected with the livestock and meat industries all place the estimate of the cattle at present in Paraguay at 4,000,000. These cattle for the most part are the typical creole, or native, cattle, and probably have degenerated from the original importations of the early settlers. They are indiscriminate in color, ranging from a light-tan to black-and-white spotted. All carry the long heavy horns, and with their long legs resemble the old Texas Longhorns. Despite the fact that the pasturage is favorable to fattening, these cattle are sent in to market very thin. It seems impossible to get them fat enough to cover the prominent hips and shoulders.

Although very little in constructive breeding work has been done, there are a few companies that are trying to raise better livestock. The Societe Fonciere du Paraguay, a French company, has 263 square leagues of land in the North and Gran Chaco districts on which they have approximately 150,000 cattle, including 529 imported Hereford bulls, 100,500 breeding cows, 22,500 steers to market this year, and 25,000 calves. This company has installed dipping vats in an effort to lessen the effect of the ticks.

The Liebig's Meat Extract Company also maintains large ranches and are importing well-bred bulls from Argentina. This and other companies are making an effort to interest the people in breeding up their stock. The Sociedad Ganadera del Paraguay is an association made up of leading Paraguay ranchmen, and has about 150 members. It was formed to protect the cattle interests against unfair legislation, to study the control and eradication of cattle pests and disease, to encourage the improvement of the livestock and in general to help raise the standard of the industry. A fair is scheduled for 1920 which is planned along the lines of the Palermo exposition of Argentina.

Cattle are commonly raised to the age of three years, at which time they are made as fat as possible and sent to market. The marketing until the establishment of three American meat-packing plants consisted very largely of local consumption. Some few were sold to salt-meat plants in districts near by. With the establishment of canning abattoirs the demand, largely augmented by the war, was soon far greater than the supply. At present these plants are running about one-half capacity because of the scarcity of slaughter steers.

Some few years ago a few Zebu cattle were introduced from Brazil, the idea being to incorporate the hardiness and disease-resisting feature possessed by this hybrid. This plan was soon abandoned owing to the fierceness, poor frame, and the refusal of Argentina to allow the entry of cattle showing traces of Zebu blood. Although an effort has been made to breed out this strain it still shows in the hump of a large number of animals. Experimentation has not been entirely lacking, and it is possible to estimate at least the results of a real constructive breeding policy in this country. One feature that doubtless will prove of importance as the improvement in cattle is carried on is the natural adaptability of the native peon. He is a natural horseman and handles stock better than any other South American. He is very hardy, and in this respect has proved superior to American cow-boys who were sent to this country as an experiment. The average peon receives about 20 to 30 pesos (\$1-\$1.50) a day, while the ranch foremen (usually Englishmen or Americans) receive \$125 to \$200 per month.

HOGS

In contrast to the Brazilian, the Paraguayan is not partial to hogs or excessive amounts of lard and grease. For this reason the swine industry has not been developed to any extent. They have usually been left to forage for themselves, and consequently the few that have found their way into hands of the Paraguayan have reverted to the original type. A few establishments of foreign management have imported a few Berkshires and report conditions favorable for increased production. Both corn and cassava are easily grown; and it seems reasonable to expect an increased production of hogs. At present the packing establishments are not equipped to handle hogs, and the distance and freight to Buenos Aires is too great to allow a profit by shipping to that market.

SHEEP

Sheep have been present in Paraguay for many years. Originally they were imported from Peru and most of the creole stock now found in the country are descendants of the old Merino stock. Through inbreeding and lack of attention they have degenerated in type, form, and wool, although they appear to be a good foundation stock. The market for mutton is entirely local, and thus is very restricted. It is possible to handle the wool through Argentina; although the down-river freights make the profit much less than wool of the same grade from Rio Grande do Sul and Argentina. The wool is short and of fairly good quality. The introduction of a few Lincoln and Rambouillet rams on several of the ranches has resulted in a very noticeable improvement.

HORSES

Horses are raised chiefly for saddle use, as the lack of roads makes it necessary to adopt the slower method of locomotion. Most of the hauling is done with oxen in the country districts, while in the city of Asuncion a large number of mules are used. In either case the manner of hitching is very primitive. One sees five or six mules attached to a cart, each pulling from one rope trace running from a circingle across the breast and back to some part of the two-wheeled cart. The oxen are in most cases attached by means of a yoke fastened to the horns. The horses are descendants from the Spanish Arab stock, and are small though strong. They seem to have great endurance and are well trained at the hands of the peon, who appreciates the value of his horse and handles him accordingly.

Possibilities for the Development of Markets

Originally the market for cattle was for local consumption and for a few salt-meat plants. With the entrance of American capital and canning plants, and especially the great demand caused by the war, the salt-meat plants were forced out of business, with little likelihood of their being able to again compete with the more modern meat-canning establishments. These American plants are looking to the time when frozen beef is possible. At present there are three canning plants in Paraguay. These are paying 25 to 28 Argentine pesos gold (\$24.13 to \$27.32) cold dressed weight, for cattle delivered at the plant. This is the preferable method of purchasing and is used to a large extent in the districts near by. In the more remote districts the price per head is now from \$95 to \$130 Argentine paper (\$40.34 to \$55.20).

As in the other countries where cattle is an important industry, the war has caused a great inflation in price and successful stock raisers have made large profits. At the same time the demands for large numbers of cattle have taken most of the surplus. One effect of this is the creation of a desire for better stock. The companies located in Paraguay, especially those of foreign capital, and the ranches that employ American and English managers are looking towards the time when there is a larger amount of good stock. Naturally this is seconded by the packing houses, which have made large investments in canning machinery and which are trying to develop a frozen-meat industry. The time when the export of frozen beef from Paraguay will be possible is remote, however, unless certain conditions regarding immigration and transportation change rapidly.

One drawback to immigration is the fact that it is necessary to enter the livestock business on a large scale, and as this requires large capital many desirable foreigners are deterred from coming to Paraguay. The other alternative, that of settling and growing up with the country, is seriously handicapped by the low wages and consequent long time necessary to become established. Rents also are high, although tenantry is practiced to a large extent.

Paraguay presents the problem of a tropical country, with its many diseases and pests of live stock, poor transportation, and large tracts of wholly undeveloped country. Its advantages are its already established market, a fair foundation stock, proximity to sources of supply, and opportunity for big results from intelligent effort.

The country needs large numbers of improved breeding stock of all classes, and the question of the rapidity with which this will be corrected resolves itself into the question of competition between individuals, which has never been keen enough to make it necessary to improve the stock.

The struggle for existence in Paraguay consists largely of raising the most of the products necessary to life on each ranch. As vegetables grow abundantly, and with each establishment self-sustaining, the effort of existence is very slight. This would indicate that progress would be slow and as regards livestock it would be a question of forcing the country to improve through discrimination. This the packing companies will be able to accomplish with a lessened demand for canned products and an opportunity to reward efforts along the right line with better prices. How rapidly this will change the general grade of Paraguay's livestock can not be estimated at this time, but an incentive as powerful as this has always proved to be, should be noticeable within a comparatively short time.

LITTLE OPPORTUNITY FOR PURE-BRED LIVESTOCK FROM THE UNITED STATES

From the foregoing it will be seen that the market for pure-bred livestock will have to be developed slowly, and that the volume of business will be very small for some time. Argentina, the nearest competitor, is able to furnish large numbers of breeding stock of improved quality, immune to the tick, and at prices prohibitive of United States competition. With the additional fact that river freight rates are controlled by that country, it would seem that the effort required to obtain the small volume of business available at present is too great to warrant any large investment in time or money.

With larger investments from the United States, particularly with the establishment of ranches in this country, owned or managed by United States ranchmen accustomed to improved methods, a gradually increasing trade with the United States is to be expected.

